

IN THE CLAIMS:

The listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A receiver for receiving a signal of a desired user, which signal may arrive at the receiver in different components along several different paths at several different delays, the receiver comprising:

an antenna array composed of more than one element for receiving the signal,

one or more rake branches for demodulating the received ~~signals~~ signal,

A) at least one search branch adapted to calculate ~~the~~ a two-dimensional impulse response of the received signal by searching for ~~the~~ incoming directions and delays of components of the received signal components, and to transmit information ~~on~~ indicating the a most favorable signal component components found to demodulated by the one or more rake branches,

and in which at least one rake branch includes ~~comprises~~

a ~~number~~ plurality of beam formers including a first beam former, and a ~~number~~ plurality of correlators including a first correlator and being respectively coupled to the outputs of the beam formers, and a demodulator coupled to the outputs of the plurality of correlators,

a code generator for generating the codes required by the plurality of correlators,

control means adapted to control the operation of the code generator and the plurality of beam formers via at least one control signal, ~~to~~ by which control means, information is received from the search branch about the incoming direction and delay of the most favorable signal component, and

calculation means whose inputs ~~comprise~~ include the outputs of the plurality of correlators, the calculation means being adapted to calculate and transmit to the control means, on the basis of the outputs of the plurality of correlators, information on how the code generator and the plurality of beam formers are to be controlled to ensure that the first beam former and the first correlator receive the most favorable signal component via the direction and delay calculated for this purpose,

wherein, the plurality of correlators included in the at least one rake branch are adapted to calculate a correlation from a calculated incoming direction and from left and right sides of that incoming direction of that at least one rake branch, and

wherein the calculation means are adapted to calculate a control signal for controlling the beam formers such that, if the correlation result calculated from the left or right side of the incoming direction is higher than the correlation result obtained from the calculated incoming direction, the first beam former is controlled to receive the signal from the left or right side of the incoming direction having the higher correlation result.

2. (Canceled)

3. (Currently Amended) A receiver as claimed in claim 2 ~~1~~, ~~comprising a~~ wherein the calculation means is adapted to calculate control information for the code generator and the beam formers such that the correlation value indicated by the output signal of the first correlator is as high as possible.

4. (Currently ~~Amended~~) A receiver as claimed in claim 2 ~~1~~, ~~comprising a~~ wherein the calculation means is adapted to calculate for the code generator a phase change and for the beam formers an angular change such that the correlation value indicated by the output signal of the first correlator is as high as possible.

5. (Currently ~~Amended~~) A receiver as claimed in claim 1, ~~comprising a~~ wherein the calculation means is adapted to calculate control information for the code generator and the beam formers at predetermined intervals.

6. ~~(Canceled)~~

7. ~~(Canceled)~~

8. (Currently ~~Amended~~) A receiver as claimed in claim 2 ~~1~~, ~~comprising a~~ number wherein the plurality of correlators are adapted to calculate the correlation before and after the calculated delay of the ~~desired signal components~~ most favorable signal component.

9. (Currently ~~Amended~~) A receiver as claimed in claim 8, ~~comprising a~~ wherein the calculation means is adapted to calculate the control signal of the code generator in such a way that if the correlation result calculated before ~~and~~ or after the calculated delay of the ~~desired~~ most favorable signal component is higher than the correlation result obtained from the calculated delay, the code generator is ~~controlled in the direction of said delay value~~ operative to shift code phase to a phase before or after the calculated delay.

10. (Currently Amended) A receiver as claimed in claim 1, ~~whose~~ wherein at least one rake branch comprises includes a noise code generator and a ~~number~~ plurality of correlators which are coupled to the outputs of ~~the~~ beam formers, wherein and to whose input is inputs of the respective correlators are coupled to the output of the noise code generator, and the at least one rake branch further including a demodulator coupled to the ~~output~~ respective outputs of the correlators, the demodulator being adapted to calculate the noise level from the calculated incoming direction of the ~~desired~~ most favorable signal component.

11. (Currently Amended) A receiver for receiving a signal of a desired user, which signal may arrive at the receiver in different components along several different paths at several different delays, the receiver comprising:

an antenna array composed of more than one element for receiving the signal,

one or more rake branches for demodulating the received signal,

at least one search branch adapted to calculate a two-dimensional impulse response of the received signal by searching for incoming directions and delays of components of the received signal, and to transmit information indicating a most favorable signal component demodulated by the one or more rake branches,

and in which at least one rake branch includes

a plurality of beam formers, and a plurality of correlators being respectively coupled to the outputs of the beam formers, and a demodulator coupled to the outputs of the plurality of correlators,

a code generator for generating codes required by the plurality of correlators,

control means adapted to control the operation of the code generator and the plurality of beam formers via at least one control signal, by which control means, information is

received from the search branch about the incoming direction and delay of the most favorable signal component, and

calculation means whose inputs include the outputs of the plurality of correlators, the calculation means being adapted to calculate and transmit to the control means, on the basis of the outputs of the plurality of correlators, information on how the code generator and the plurality of beam formers are to be controlled,

A receiver as claimed in claim 1, wherein comprising different beam formers and correlators in the at least one rake branch are respectively used for signals of branch I and Q.

12. (Currently Amended) A receiver as claimed in claim 11, ~~comprising a~~ wherein ~~the code generator that~~ generates the following codes having different phases:

- on-time I,
- on-time Q,
- late I,
- early Q.

13. (Currently Amended) A method of receiving a signal of a desired user, which signal may arrive at the receiver in different components along several different paths at several different delays, the method comprising:

receiving the signal by an antenna array composed of more than one element,
demodulating ~~the signal~~ components of the received signal by one or more rake branches,

calculating ~~the~~ a two-dimensional impulse response of the received signal by
searching for ~~the~~ incoming directions and delays of components of the received signal
~~components demodulated by the one or more rake branches,~~

determining ~~the~~ a most favorable signal components component,

transmitting information ~~on the~~ indicating the most favorable signal component
~~components found to demodulated by the one or more rake branches,~~

processing the signal at each rake branch by a beam former in such a way that the
output signal of the beam former ~~comprises~~ includes a signal component received from a
desired direction,

correlating the output signal of the beam former in correlators, wherein said
correlating includes calculating a correlation from a calculated incoming direction and from
left and right sides of that incoming direction of each rake branch,

demodulating the correlated signal,

generating codes required by the correlators by a code generator,

controlling the code ~~generators~~ generator and beam formers on the basis of the
incoming direction and delay of the signal component,

monitoring the incoming direction and delay variation of the signal component on the
basis of the output signals of the correlators, and

controlling the code generator and the beam formers by means of said monitoring,
wherein the beam formers are at least in part controlled by calculating, inside each
rake branch, a control signal for controlling the beam formers such that, if the correlation
result calculated from the left or right side of the incoming direction is higher than the
correlation result obtained from the calculated incoming direction, a first beam former is

controlled to receive the signal from the left or right side of the incoming direction having the higher correlation result.

14. (~~Currently Amended~~) A method as claimed in claim 13, ~~comprising~~ controlling wherein the code generator and the beam formers are controlled such that ~~the~~ a correlation value indicated by the output signal of ~~the~~ a correlator to which the signal received from the desired direction has been applied is as high as possible.

~~15.~~ (~~Canceled~~)

~~16.~~ (~~Canceled~~)

17. (~~Currently Amended~~) A method as claimed in claim 13, comprising calculating the correlation before and after the calculated delay of the ~~desired~~ most favorable signal component.

18. (~~Currently Amended~~) A method as claimed in claim 17, wherein the code generator is so controlled that if the correlation result calculated before and after the calculated delay of the ~~desired~~ most favorable signal component is higher than the correlation result obtained from the calculated delay, the code generator is ~~controlled in the direction of~~ said delay value operative to shift code phase to a phase before or after the calculated delay.
